

Strategic Framework for Investing in CT's Transportation Infrastructure:

Economic Growth - Infrastructure Preservation – Sustainable Communities

DRAFT (2010-12-22) – for review



As we enter 2011, Connecticut confronts a critical juncture regarding its transportation system. We continue making progress toward developing a multimodal transportation network that reduces our dependence on highways. However, the cost of developing that network and preserving the existing infrastructure clearly exceeds the state's current resources.

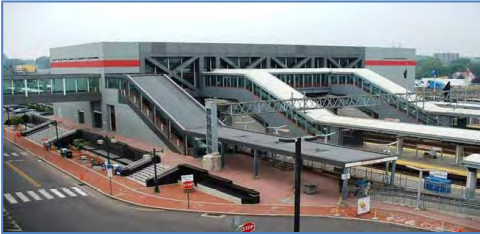
Connecticut's transportation needs do not exist in a vacuum. How we deal with them will directly affect the state's quality of life, its communities, its environment and its economy. These issues have been debated for many years, but only partially addressed. Today, we cannot shrink from tackling them head-on in a comprehensive way. In 1999, the Gallis report¹ warned that we need to make major improvements to our transportation system to sustain growth in our economy. That report led to the creation of the Transportation Strategy Board (TSB) and many of the improvements undertaken over the past decade. But much remains to be done, and that will require more funding than is currently available.

The ongoing national recession makes it difficult to consider raising new revenues to support new or expanded transportation investment programs. While our fiscal and economic challenges may seem overwhelming, a program of increased but strategic investments can yield large benefit to Connecticut's economy. More importantly, the risks of not acting are even greater. Delaying action threatens Connecticut's long-term economic growth and competitiveness. Acting now allows Connecticut to build on the momentum from recent transportation investments in critical projects, the growing state and national emphasis on multimodalism, and the evolving managerial structure at the Department of Transportation (DOT) that is improving efficiency and responsiveness.

We are also in the midst in a major shift in our transportation planning paradigm – one that recognizes the importance of linking transportation planning to economic development, responsible growth and sustainable development. Acting now will allow us to take advantage of this groundwork.

Connecticut needs to invest more in its transportation system, but to do so wisely and strategically. We need to support improvements that promote state strategic goals of economic growth, sustainable development and improved quality of life while assuring a safe and well-maintained transportation system.

¹ *Connecticut: A Strategic Economic Framework*, 1999, prepared by Michael Gallis for the CT Regional Institute for the 21st Century



Over the last year, the TSB reviewed the state of our transportation system and examined how congestion and transportation deficiencies are adversely affecting our economy. The Board also considered whether our and business, and how it can support broader state goals of economic growth, sustainable development, and livable communities.

This document provides a summary of our major findings and conclusions. It calls for increased but more strategic investments in our transportation system. The investment is required to address critical infrastructure preservation and repair needs, but more importantly it is needed to restore and sustain economic growth. It also calls for making transportation investments in a manner that supports state goals of improving quality of life, promoting responsible growth and improving our environment.

The total cost of meeting both our basic system preservation needs² and system expansion/enhancement³ needs is great. DOT estimated the cost of unfunded projects in its recent capital plan to be \$15-20 billion. While the fiscal challenge is great, it is manageable if needs are prioritized and revenue increases are phased over time to meet the cash flow needs of a long-term capital program and schedule of projects.

The TSB recommends an approach that prioritizes projects in a way which allows the state to keep its infrastructure in a good state of repair and undertake strategic system expansion or enhancement projects. The Board also recommends focusing on a 10-year timeframe and developing a program and schedule of projects that can be financed with revenue increases phased in over the 10-year period. The proposed program does not address all of the \$15-20 billion needed, but does address the most critical needs. It consists of the following elements.

Programmatic Preservation Funds (\$1.5 billion in years 1-10)

Major Preservation Projects of Strategic Value (\$3 billion in yrs 1-10)

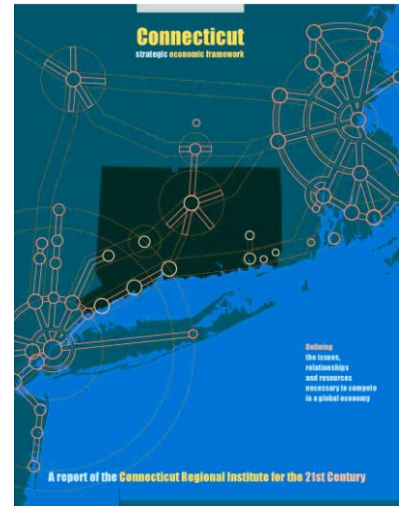
Major Enhancement Projects of Strategic Value (\$3 billion in yrs 1-10)

² **Preservation** includes repair and rehabilitation of roads, bridges, facilities, and equipment for the purpose of keeping them in good operating condition. It can include the replacement of those items when they reach the end of their design life and repair or rehabilitation is no longer cost-effective.

³ **Enhancement** includes building new or modifying existing roads, bridges, facilities, and equipment for the purpose of increasing capacity, or improving safety, efficiency, or quality of service. Examples include adding travel lanes for more capacity, adding rail cars to increase capacity, upgrading transit stations to improve quality of service.

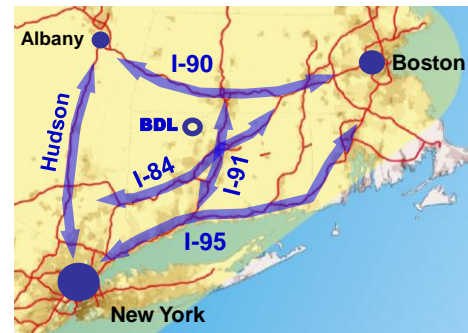
I. The Economic Costs, Risks, & Opportunities

Connecticut's economic future and its transportation future are inextricably linked. Without major improvements to important transportation linkages, our economy will stagnate even as neighboring economic centers grow. With sufficient and strategically focused transportation improvements we can position the state to share in the economic growth that will eventually return to the nation, and we can realize the full benefit of being in close proximity to the world's financial and economic center. Maintaining good access to New York is important because it is at the center of national and global transportation networks – air (cargo and passenger), maritime (freight), and highways (including trucking). Strategic transportation investments will not guarantee economic growth, but they are necessary to support and sustain growth.



The 1999 strategic economic framework report by Michael Gallis was not the first to note the importance of transportation for economic growth, but he did surprise many people when – as part of a study of the state's economy – he observed the degree to which transportation problems were impeding Connecticut's ability to grow its economy. He suggested that if the transportation problems were not fixed, Connecticut's economy would lag well behind that of our neighboring economic power centers in New York and Boston.

Corridors: The Gallis report emphasized the importance of maintaining strong linkages to New York's economy, access to its markets, and to its national and international transportation hubs. He observed that access was weakening as congestion made transportation more difficult and costly, and as new and evolving national and global transport systems gave better access to areas west of the Hudson. Gallis identified several multimodal transportation corridors that were of vital importance to Connecticut's economy. Three are within Connecticut:



- **I-95 (NY-RI):** A multimodal corridor that links Connecticut to NYC and is an important passenger rail link, highway link and truck route for freight. It is defined by I-95, the Merritt Parkway and the New Haven rail line
- **I-84 (NY-Hfd-MA):** A highway corridor that links Connecticut to NYC and is an important truck route for freight. It is defined by I-84.
- **I-91 (New Haven-Springfield):** A multimodal corridor that serves the highly urbanized NH-Hartford-Springfield corridor and links three east-west corridors. It is defined by I-91 and the New Haven - Springfield rail line. It is also home to Bradley Airport, Tweed-New Haven Airport, and the Port of New Haven - which supplies much of the state's petroleum.

Hub: Bradley Airport. Gallis also identified one critical transportation hub in Connecticut: Bradley Airport. Bradley is much more than a transportation facility. It is an important facilitator of economic growth. The 1999 Gallis report recognized this, but a 2005 study by the state Department of Economic and Community Development clearly defined Bradley's value as an

BRADLEY AIRPORT
Engine of
Economic Growth

economic engine. The study estimated that over a 20-year period, the airport would create over 140,000 jobs and \$34 billion in economic output. It would also generate more than \$11 billion in additional income for residents.⁴

Airports create this value by acting as facilitators that provide faster, more convenient and better access to national and international markets and economic centers. This benefits business travel, tourism and transport of high value, low bulk products. It is especially valuable to many of the high tech, medical, research and educational firms and institutions located in Connecticut, but especially those in the I-91 or "Knowledge Corridor."

\$34 Billion added
to state economy

'It is as an economic facilitator that an airport truly impacts an economy. As an economic facilitator airports allow other "economic entities" to create more economic activity than they otherwise could create without their presence. It is the value of the access that is provided by the presence of the airport that has the greatest and most far-reaching influence on an economy.'
The Contribution of Bradley International Airport to Connecticut's Economy, 2005, CT DECD

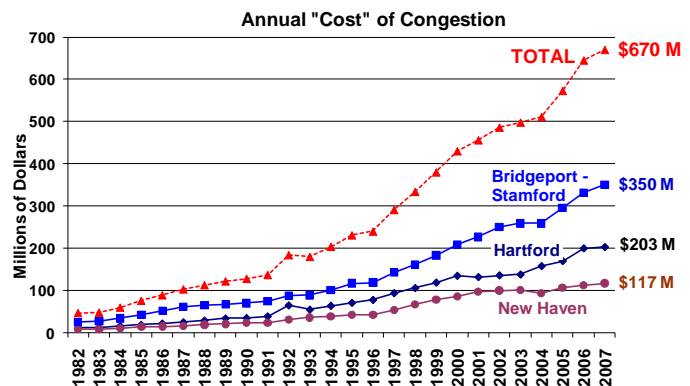
The Cost of Congestion (conservative estimate: over \$670 million annually)

The 1999 strategic economic framework report raised concerns about the growth of congestion. Congestion reduces the ability of Connecticut's major transportation corridors to provide effective access to New York and their ability to support economic activity within the state. High levels of congestion are reducing access to New York and increasing the cost of interacting with New York.

Congestion impacts virtually every urban area in Connecticut, but it is particularly severe in the Bridgeport-Stamford area. The Urban Mobility Report (UMR) estimates that congestion causes over **32 million hours of delay** annually in our three largest urban areas. A daily problem that can range from an inconvenience to a major impediment to travel, congestion imposes an enormous cost on state residents and businesses. The estimated **annual cost of congestion exceeds \$670 million** in lost time and wasted fuel. The actual cost is probably much higher.

32 million hours
of delay annually

The estimate is conservative because it is based on the Urban Mobility Report⁵ (UMR), which does not include smaller urban areas such as Danbury, Waterbury and New London. The UMR also uses national averages that do not reflect the higher wage rates in Connecticut or the fact that our congestion extends beyond the traditional morning and afternoon peak periods. A study conducted for the Southwestern CT Regional Planning Association (RPA), found that when local wages rates are used and a more complete accounting of congestion is done, congestion costs in Southwestern Connecticut far exceed the costs suggested by the UMR study.⁶

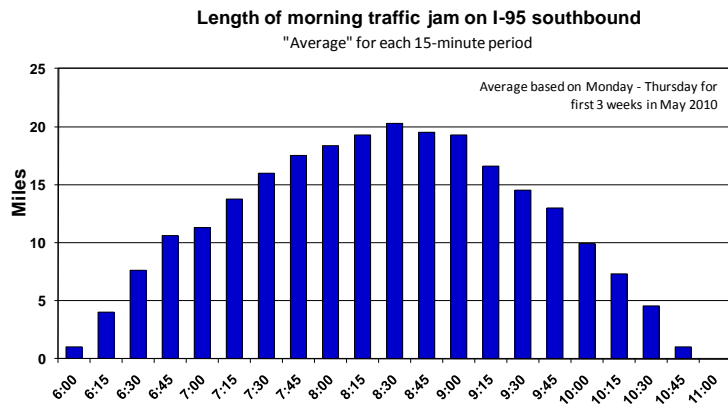


⁴ The Contribution of Bradley International Airport to Connecticut's Economy, 2005, CT DECD

⁵ Urban Mobility Report, 2009, Texas Transportation Institute

⁶ Measuring the Costs of Congestion: SWRPA Region & Westchester County, 2010, prepared by Urbanomics for South Western Regional Planning Agency & Westchester county Dept. of Planning.

To fully appreciate the potential impact on businesses, the duration as well as the extent and severity of congestion in the I-95 corridor must be considered. Congestion has become pervasive and affects much of the corridor over an extended portion of the day. Planning deliveries and travel to meetings requires building in lots of extra travel time, or taking advantage of relatively small windows of opportunity during the day when congestion is normally absent. Traffic back-ups begin shortly after 6:00 am on a typical morning and last until almost 11:00 am. The length of the back-up reaches over 20 miles around 8:30, but is still 10 miles in length at 10:00 am. This means that if you choose to travel I-95 at 10:00 am on a weekday morning, you should expect to encounter stop-and-go conditions in at least 10 miles of the corridor.



The extent and duration of such severe congestion (stop-and-go conditions) makes it very difficult for commuters to reach jobs, for residents to conduct normal household travel such as trips to medical appointments, and for companies to conduct normal business activities.

Such severe congestion currently exists primarily in the Bridgeport-Stamford area, but its impact is felt throughout all of Connecticut. As the state's primary link to New York markets, economy and transportation hubs, congestion in the I-95 corridor reduces the entire state's access to this global economic and transportation center. Gallis noted that severe congestion was not only restricting the Bridgeport-Stamford area's ability to grow, it was also restricting the ability to grow the economy in the New Haven-Hartford-Springfield economic region and in the Southeastern Connecticut economic region. I-95 corridor congestion threatens to choke off economic growth throughout the state.

Importance of Transportation Investment to Economic Growth

Gallis and others have clearly demonstrated how transportation infrastructure supports economic growth. However, quantifying its impact is difficult and not easily done. The difficulty derives from the number of variables that affect economic growth and the complexity of their interactions. It is further complicated by the fact that while good transportation is a *necessary* condition for economic growth, it is not *sufficient* by itself. Other market forces must be strong enough for growth to occur. For example, a good transport system will not assure growth in Connecticut if the national economy is in recession.

The economic benefits of the transportation investments proposed in this report are difficult to quantify without an analysis of each individual project. However, insight to how the proposed investments will facilitate economic growth can be gained from a special study done by the CT Department of Economic and Community Development (DECD) for I-84 in Waterbury. This study was unusual in two ways. First, it was a collaboration between DECD and the DOT to

evaluate a transportation problem. Second, DECD employed an unusual combination of economic models and transportation models to provide an assessment of the economic growth effects of a transportation improvement. This special modeling is rarely done on transportation projects, so it serves as an instructive case study of how transportation improvements can support economic growth.⁷

Case Study: I-84 Viaduct in Waterbury. The DECD analysis was done as part of a larger study by the DOT of options for replacing the aging elevated section of I-84 through Waterbury, which includes an interchange with Route 8. The project goals are to replace an aging viaduct, eliminate the safety problems associated with the Route 8 interchange, reduce congestion by adding a third lane, and provide redevelopment opportunities in Waterbury.

The DECD analysis determined that replacing the viaduct with a new viaduct that is safer, reduces congestion and offers more opportunities for development could facilitate significant economic growth. They estimated the state economy could grow by as much as 9,300 jobs and \$1.1 billion in annual economic output.

Economic growth
9,300 jobs annually
\$1.1 billion annually

Business Perspectives on Transportation Investment. The importance of transportation investment to economic growth is also recognized by business leaders in the state. In surveys of businesses in different regions of the state, the Connecticut Business and Industry Association (CBIA) found the support for transportation investment almost universal. Fairfield County businesses expressed the strongest support with 96% of business leaders surveyed responding that “modernizing the current transportation infrastructure [is] somewhat or extremely important to the region’s economic growth.” Similar but slightly lower levels of support were found in all regions surveyed.

While support for transportation investment is almost universal, the reasons for the support differ by region. Fairfield County businesses are most concerned about congestion and its impact on access to New York. As expressed in the survey report:

“Fairfield County’s proximity to the financial capital of the world is relevant only if residents, employees, clients, products, investors, and service providers are mobile and accessible. Even in a global marketplace connected as much by the Internet as by interstates, reliable access to customers and workers is essential. Record growth in Metro-North Commuter Railroad ridership (both in-state and out-of-state) is evidence of the importance of geographic connectivity even in a technologically linked society and economy.” Fairfield County Business Survey, CBIA, 2009, p. 7

This quote from the 2009 survey highlights one way in which some economic growth in the I-95 corridor was continued even as congestion brought traffic on I-95 and the Merritt Parkway to a crawl. While highway capacity was exhausted, capacity still existed on Connecticut’s New Haven Line. With frequent service throughout the

**New Haven Line
service helped sustain
economic growth.**

⁷ It is also an example of the type of analysis called for in recommendation 2(a) in Section III of this report.

business day and well into the evening, the New Haven Line rail service was able to support some business growth in the corridor that would not have been possible otherwise. Businesses and commuters turned to rail options as highway access and mobility was restricted.

In other parts of the state the reasons for support for transportation investment reflects the nature of the respective regional economies as well as the status of the regional transportation systems. For example, in Southeastern Connecticut congestion is not a major concern, but good transportation links are considered important to supporting and growing the area's tourism industry. In the Hartford-Springfield region, congestion is an important reason for supporting transportation investment, but so is the perceived need for more transit service.

II. The Challenge of Preserving Our Transportation Infrastructure

Connecticut faces an enormous infrastructure preservation challenge. Our highway and transit systems are some of the most intensely used in the country, but our infrastructure is among the oldest and is subject to some of the harshest weather conditions. Maintaining what we have under such intense use and demanding conditions is straining our financial resources. Over the last three decades we were able to make progress toward improving the state of repair of our assets, but that progress has largely ceased, and in some cases has begun to reverse itself. This section provides an overview of the challenge of maintaining our infrastructure, our level of need, and future trends.



Operating and maintaining a transportation infrastructure as large and complex as Connecticut's is a difficult and expensive task. The state owns approximately 3,700 miles of highways, 3,900 highway bridges, 230 miles of rail track, 200 railroad bridges, 270 rail cars, 650 buses, six airports, a state pier, two ferries, and numerous buildings such transit stations, highway garages and highway service plazas and rest stops. In addition to the state-owned facilities, our cities and towns own and maintain an extensive system. Although less traveled, the 17,265 miles of local roads and 1,241 local bridges are an important part of our entire network.

Connecticut's coastal environment poses challenges that often require expensive solutions. Both highway and rail networks require more bridges – and often specialized bridges. Rail bridges over 'navigable' waterways pose a special challenge. Often, the only viable solution is a 'movable' bridge that can be raised or swung out of the way when marine traffic needs to pass. Movable rail bridges are expensive to build, maintain and operate. DOT owns six of these movable rail bridges and five of them are over 100 years old. This means much of our state commerce is dependent on the safe and reliable operation of these century-old bridges. For example, if the New Haven Line's moveable bridges in Westport and Norwalk were to fail to close properly, the New Haven Line would be shut down – and so would considerable commuter and business activity.

In addition to the size and complexity of our transportation infrastructure, the management of Connecticut's transportation system must account for the extra burden of the very intense use, unforgiving climate and advanced age of our highway and rail systems.



Cos Cob draw bridge –movable span DOWN



Cos Cob draw bridge –movable span UP



Walk swing bridge –movable span OPEN



- Many of our highways (I-95, I-91, I-84) serve 100,000 – 170,000 vehicles per day and truck volumes comprise 10-15% of that amount.
- The New Haven Line is the nation's busiest rail lines with over 36 million riders per year.
- Harsh winters cause pavements, structure, and vehicles to deteriorate faster. Salt applications and freeze-thaw cycles cause more rapid deterioration of pavements and structures alike.
- Like many northeastern states our infrastructure is old. The average age of our highway bridges is 50. Five of our major rail bridges are 100 years old.

In summary, Connecticut's transportation system is a large complex multimodal system that is intensely used, but aging and subject to harsh environmental conditions. It has served Connecticut well, but its ability to continue to do so is threatened by increasing demands and reduced resources to maintain and improve it.

Interstate Building Era Poses Special Problem. Our Interstate highway system poses a special problem by virtue of the fact that most of it was built in the 1950s and 1960s. Bridges and structures built in that time period are now 40-60 years old and nearing the end of their design life. With so many expensive structures reaching the end of their life span at the same time, we are facing a major financial challenge.

The potential scale of this problem can be seen in **Figure XX**. It shows the age profile of Connecticut's bridge inventory. Almost half of the bridges were built in the 1950s and '60s as part of the Interstate building surge. They will soon need full reconstruction or replacement. The federal government financed the building of the Interstate system, but is leaving most of the rebuilding to states.

Restoring & Maintaining State of Good Repair

In 2008, the DOT conducted an assessment of the level of resources needed to maintain, restore, and reconstruct or replace our infrastructure. The total cost of maintaining, restoring or replacing the state's transportation infrastructure was projected over the ensuing 10 years. The 10-year cost projection was then compared to the estimate of available federal

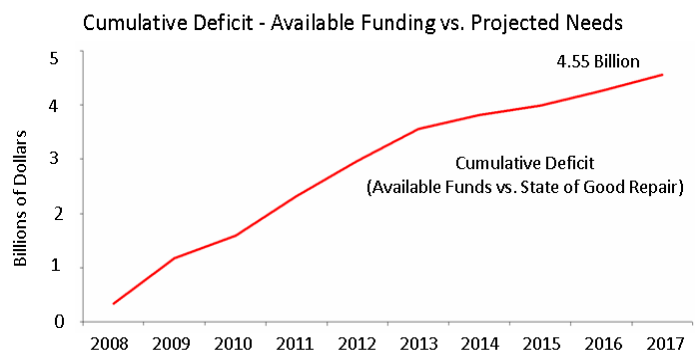
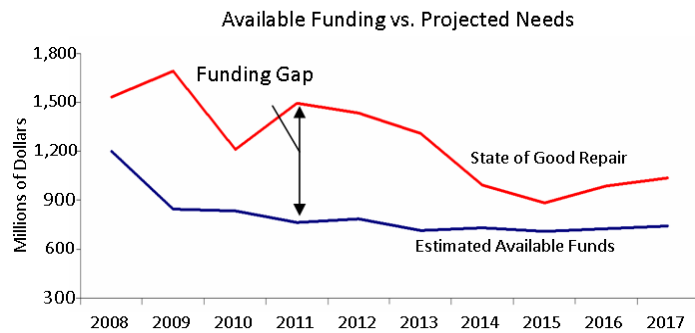
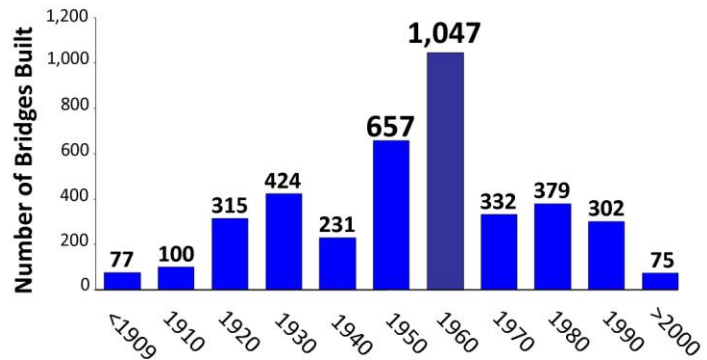
and state funds over the 10-year period. This provided a rough estimate of our level of need versus our financial capacity to meet that need.

The conclusion of the 2008 assessment is that the cost of the projected 10-year program greatly exceeds anticipated revenues. This analysis is summarized in Figure xx. The lower line in Figure xx represents the anticipated revenue from 2008 through 2017 for transportation projects and programs (highways and public transportation.) The red line represents the projected level of funds needed to preserve existing infrastructure (maintain, repair, reconstruct and replace). The difference between the two lower lines is termed the 'state of good repair funding gap' and indicates the anticipated funding shortfall to preserve the existing network.

The state of good repair funding gap shown in Figure xx is a function of two trends. First, projected revenues are expected to decrease in the next few years as bonding capacity in the State Transportation Fund diminishes and as we wind down the 10-year special funding programs authorized by the Legislature in 2005 and 2006. Those two special programs provided an infusion of bonding capacity (\$1.3 billion in 2005 and \$1.0 billion in 2006) that helped reduce some of the backlog of major capital projects in Connecticut. Second, the maintenance and preservation needs are increasing over the near term. The combination of increasing needs and decreasing revenues creates a gap of \$300 – \$500 million per year that does not diminish significantly until 2013 or 2014.

The cumulative effect of this state of good repair funding gap is illustrated in Figure xx. The line in Figure xx is the cumulative unfunded need for state of good repair improvements. The gap today is about \$2 billion, but it grows to more than \$4.5 billion in 2017.

Bridges Built by Decade of Construction



III. The Way Forward: More Funds, More Strategic Investments

The role of the Transportation Strategy Board is to formulate a strategy to improve Connecticut's transportation system. That role was defined for the TSB partly in recognition of the need to broaden state transportation goals to address more than just transportation safety, capacity and mobility. The TSB's charge was to assure that transportation investments also supported other state strategic goals such as growing a strong economy, promoting sustainable development, and protecting our environment and our quality of life. It is in that spirit that the recommendations presented below are made. We chose not to recommend individual projects, but rather to suggest strategic directions that we believe should be pursued to assure a strong and sustainable future for our state.

Policies to Guide Overall Investment Strategy.

1. *Continue to emphasize more balanced multimodal approach.* Connecticut has undergone a significant shift in policies and programs from a highway-oriented focus toward a more balanced multimodal approach to meeting the mobility needs of residents and businesses. This multimodal approach needs to continue and strengthen.

a. Improve bus service. Bus service is the foundation of Connecticut's transit system, and serves many functions and geographic areas. In urban markets, it is the primary means of commuting to work for transit-dependent workers, but also the mode of choice for many suburban residents who use express buses. In cities with rail service like Stamford, buses and private shuttles expand the reach of rail service by transporting rail passengers to workplaces located beyond walking distance from the train station. Public bus services are also important to the elderly, those with disabilities, and rural residents. Connecticut needs to improve its bus services and better integrate the many individual systems across the state. Extending the coverage areas, providing connecting services between cities, and providing a more consistent level of service across the state should be a strategic goal.



b. Improve rail service. Passenger rail service is critical to the economic health of the NY-New Haven corridor where highway congestion is constraining economic growth and options for highway expansion are limited. Rail is also important to supporting economic growth in other areas such as the Route 7 corridor (served by Danbury Branch), Route 8 corridor (Waterbury Branch), New Haven – New London corridor (Shore Line East), and New Haven-Springfield corridor (New Haven-Hartford-Springfield service). We need to continue to improve and expand service in these corridors as well as address the major infrastructure preservation needs.



new M-8 rail car

c. Improve conditions for pedestrian & bicycle travel. Walking and bicycling are important modes of travel in their own right, but they are also important means of accessing rail and bus services. We need to assure that roads are designed and built to accommodate pedestrians and bicyclists, and that our transit systems are easily accessible by pedestrians and bicyclists. DOT



has recently shifted its policies to be more supportive of nonmotorized modes of transport. This new emphasis needs to continue.

- d. *Intermodal connections.*** Multimodal transportation is much more efficient and effective when there are numerous intermodal connections that provide safe and convenient opportunities to transfer between modes. We need to manage our bus stops, commuter parking lots and transit stations to assure they are safe and convenient, and we need to design transit routes and coordinate transit schedules to better connect rail and bus services.

- 2. *Link transportation to economic growth, sustainable development, & environmental goals.*** Connecticut should adopt a transportation planning paradigm that recognizes the importance of linking transportation planning and decision-making to economic growth, sustainable development, environmental and quality of life goals.



- a. *Develop & integrate economic assessment tools into planning process.*** To evaluate the true strategic value of its largest investments, DOT should develop a process for assessing the economic benefits of major transportation projects. The process must be able to assess both the short-term economic impacts (example: construction jobs), and the long-term impacts derived from lower transport costs and improved access to national markets. The case study of the I-84 in Waterbury summarized on page 6 of this report is an example of this type of analysis.
 - b. *Consider sustainability, livability, & environment early in planning.*** These goals should be considered early in the planning process and prior to the formal environmental assessment. Incorporation of project elements that enhance livability and sustainability can yield economic benefits by reducing long-term costs of maintaining infrastructure and by making Connecticut more a more attractive place to live and do business. Since our quality of life is an important factor in attracting and keeping businesses, it should be considered as an important aspect of transportation investments.

- 3. *Develop BDL as important transportation hub & economic resource.*** Airports are important facilitators of economic growth, and Bradley plays an important role in linking Connecticut to national economic centers and markets. Connecticut should continue to develop the airport to maximize its economic potential. This includes the development of air passenger and air cargo services, on-airport facilities, and off-airport development areas.



- 4. *Develop Freight Capacity in CT & in Northeastern U.S.*** Connecticut is not heavily dependent on freight services for transporting products out of state. However, it is very dependent on freight services for supplying consumer goods used by residents and for materials used by industries. Since 98% of our freight moves by truck, we must ensure that we accommodate this mode of transport as safely and efficiently as possible. But we must also develop alternate modes. This means improving our railroads and ports to improve their performance and adapt to changes in national and international trade and transport systems. This requires improving the freight infrastructure within our state, but also collaborating with other states to improve the rail, marine, and pipeline infrastructure in the Northeast.
- a. *Interstate Actions.*** Connecticut should collaborate with other northeastern states to develop a strategic plan that identifies critical deficiencies and defines a strategy for addressing them. It should work with our regional partners on the investigation of future freight and goods movement and participate directly in the Cross Harbor Tunnel EIS.

- b. Intrastate Actions.** Some critical freight needs within Connecticut were defined in previous studies, but relatively little progress has been made to address the needs. We should allocate funds to begin addressing critical needs of state ports and freight railroads.

Increase the Level of Transportation Capital Investment.⁸

One major conclusion drawn from the Board's review of Connecticut's transportation system, programs and policies is that we need to substantially increase our level of investment in those systems. Simply stated, current investment levels are not adequate to maintain -- let alone improve -- our transportation system. Without improvements, the existing infrastructure cannot support meaningful economic growth or achieve other strategic goals.

Over the last 10-15 years, transportation infrastructure costs escalated as federal funds lagged and state gas tax revenues declined. Special state transportation bonding authorizations in 2005 and 2006 offset some of the downward trend with a large allocation (\$2.3 billion). However, they were designed around specific projects and were not intended to be long-term financing mechanisms. ***It is essential that we provide sufficient fiscal capacity to support both a program of system preservation that maintains a state of good repair, and a program of system enhancement that allows us to address strategic needs.***

The cost of meeting both system preservation needs and system expansion/enhancement needs is enormous. DOT estimated the cost of unfunded projects in its capital plan to be \$15-20 billion over the next two decades. To tackle this challenge, the Board recommends a more robust capital planning process with clear priorities, multi-year cash flow analysis, carefully structured program of increases to revenue sources, and consideration of alternative revenue sources and financing methods.

More Robust Capital Planning Process. Scarce financial resources will be used effectively if they are allocated to the highest priority projects. This requires a capital planning process that carefully manages the schedule of projects. The process needs to: (1) clearly define the principles by which priorities are set, (2) define priorities, (3) anticipate federal and state revenue streams, and (4) define a schedule of projects that is supported by a financing schedule. It must result in a long-term capital plan that identifies and prioritizes projects. This will assure funding for higher priority projects, while identifying lower priority projects that can be deferred -- or, if necessary, cancelled. The process should build on DOT's recent 5-year capital plan, but it should be refined into a more complete financial planning tool.

Phased Increases in Existing Revenue Sources. While the total cost of unfunded projects is large, the timeframe for planning, designing and constructing large projects is typically 5-10 years, and the bond repayment period often extends over 20 years. Therefore, the necessary revenue increases can be phased in over 10 years to match the cash-flow needs over that period. This approach was used to finance the 1984, 2005 and 2006 transportation initiatives.

The TSB recognizes the importance of keeping our existing infrastructure in a good state of repair. However, in addition to preservation needs, we must expand and enhance our transportation systems to assure that Connecticut remains economically competitive while protecting our environment and fostering sustainable development and livable communities.

The TSB recommends an approach that prioritizes projects in a way that keeps our infrastructure in a good state of repair, but also improves and expands the system to achieve strategic goals. The Board

⁸ The recommendations in this section are for capital investments and do not address any additional staffing or operating funds that might be required to support the capital investments.

also recommends focusing on 10-year timeframe, and developing a program and schedule of projects financed with revenue increases phased in over the 10-years.

This approach addresses the most critical needs. However, additional funding will be needed in the long term since not all capital needs can be met in the first 10 years.

The Transportation Strategy Board recommends that funding be provided to address three distinct and important categories of need. They are: (a) programmatic preservation funds, (b) major preservation projects of strategic importance, and (c) major system enhancement projects of strategic importance. The proposed program consists of the following elements.

1. **Programmatic Preservation Funds.** (\$1.5 billion in years 1-10)
2. **Major Preservation Projects of Strategic Importance** (\$3 billion in years 1-10)
3. **Major Enhancement Projects of Strategic Importance** (\$3 billion in years 1-10)

Category 1: PROGRAMMATIC PRESERVATION FUNDS.

Connecticut has a backlog of highway and transit preservation needs that must be addressed. Without additional funding, the backlog will grow and likely accelerate since much of our Interstate system was built in the 1950s and 1960s and is now reaching the end of its normal design life.

Stable Source of Annual Funding. To address the problem, the state needs a consistent and stable source of funding that is available on an annual basis. Predictable funding is essential to developing a cost-effective program of basic preservation projects.

\$1.5 Billion in Years 1-10. It is estimated that the state needs about \$300 million annually in state funding over and above the current transportation funding programs for basic transit and highway preservation programs. If the increases are phased in over 10 years, the 10-year cost will be \$1.5 billion. This will allow the state to repave an additional 150 lane-miles annually to reach its goal of 350 lane-miles. It would also allow DOT to restore an additional 25-50 bridges annually.⁹ The increased funding will also establish a transit preservation program for track repair, equipment overhauls, and station maintenance. By putting more emphasis on preservation, DOT will be able to extend duty cycles of equipment and facilities, which will ultimately reduce replacement costs.



Category 2: MAJOR PRESERVATION PROJECTS OF STRATEGIC IMPORTANCE.

Some preservation projects have value beyond simply repairing a piece of infrastructure. Some are of strategic value because the function performed by the individual piece of infrastructure is so critical that it cannot be allowed to fail or become inoperable. Other preservation projects have added value because they enhance system performance or support strategic goals such as economic growth and making communities more livable.

⁹ To achieve a 20-year bridge restoration cycle, DOT needs to perform work on 100-150 of its 3,000+ bridges per year. It is currently restoring less than 50 per year.

The first type of strategically important preservation projects includes major bridge replacements such as the Walk, Saga, Devon, and Cos Cob rail bridges on the New Haven Line. These movable bridges are over 100 years old. Should any of these bridges stop functioning, train service would be halted for tens of thousands of commuters. This would add to congestion on I-95, disrupt businesses and affect the economy

The second category includes highway reconstruction projects that also include some performance improvement or other enhancement. It is sometimes difficult to categorize a project as primarily preservation or primarily enhancement. The key determinant in defining these as preservation is that the facility is beyond its design life and needs to be fully reconstructed or replaced. When considering how to replace these major facilities, it is prudent to address the system enhancement needs and opportunities at the same time.

Two examples are: (1) the I-84 viaduct in Hartford, and (2) the I-84 viaduct in Waterbury. The latter includes the I-84/Route 8 interchange. Both viaducts are about 50 years old and need to be replaced. However, replacements would not be done without addressing safety and congestion problems, or addressing community impacts. Replacing the viaducts presents an opportunity to enhance economic development and improve quality of life in adjacent neighborhoods and the affected cities.

\$3 Billion in Years 1-10. The estimated cost of addressing our most critical preservation needs is about \$7 billion, but only \$3 billion is needed over the next 10 years. The balance of the program would extend into a second decade.

Category 3: MAJOR SYSTEM ENHANCEMENT PROJECTS.

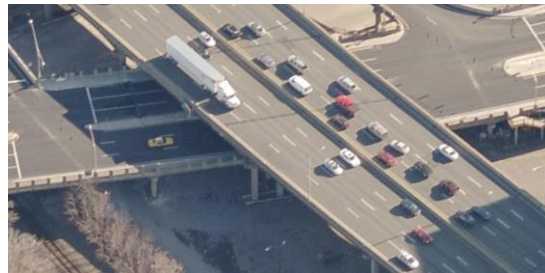
There are some large projects identified through previous studies that are needed to expand system capacity or enhance performance. Examples of these strategically important projects include: improving the New Canaan, Danbury, and Waterbury branch lines, improving the New Haven-Hartford-Springfield rail line, widening I-84 from New York to Waterbury, and reconfiguring the Route 15/Route 7 interchange in Norwalk.

\$3 Billion in Years 1-10. The estimated cost of addressing our most critical preservation needs is about \$9 billion, but only \$3 billion is needed over the next 10 years. The balance of the program would extend into a second decade.

Saga rail bridge, Westport



I-84 viaduct, Hartford



Strategically Important Corridors

The strategic importance of a project or program derives *in part* from the importance of the travel corridor it serves. There are some transportation corridors that are of special importance because they serve as conduits of travel and commerce to large areas of the state. They serve both the needs of the corridor itself as well as the needs of areas outside the corridor. Given the State's limited fiscal resources, the strategic importance of a corridor should be one of the factors considered when allocating limited funding.

Considering their role in linking Connecticut to national transportation networks and major economic centers, the two most important corridors are New York-New Haven and New York-Danbury-Waterbury-Hartford. Both corridors provide critical access to New York City and most of the national transportation network outside New England. Three other corridors that serve to connect Connecticut to other states and economic centers are New Haven-Hartford-Springfield, New Haven-New London-Rhode Island and, Hartford-Sturbridge. While other corridors serve important regional functions, these five serve important statewide and regional functions.

Assigning priority to corridors of statewide importance does not mean the needs in other regionally important corridors such as Route 7, Route 8, Route 9, and I-395 can be ignored. In some cases, individual needs in these corridors might equal or exceed some of the needs in higher priority corridors. Corridor priority should not be viewed as prerequisite for funding, but rather as one of several factors considered during funding decisions.

IV. Fiscal Challenges & Options

Advancing an expanded transportation agenda represents a major financial challenge for the State. Significant additional revenues will be required in the short- and long term in order to address the pressing transportation capital needs outlined here.

There are numerous potential options for making more funding available to support new transportation investments in Connecticut. However, they vary substantially in regard to their revenue potential, whom they impact, and public acceptability. In addition, some will impact other parts of the State budget. Identified below are those that have the best potential to generate a relatively large revenue increase. Also included is a brief discussion of federal funding sources.

In addition to the larger revenue sources discussed below, there are many smaller options that might be good candidates and should be explored further. Examples included value capture from transit oriented development, selling naming rights for stations, revision of parking policies and fee structures at station parking garages, and public-private partnerships in financing transportation improvements.

The description of each revenue source also includes an estimate of how much revenue might be raised from the source. This amount can be compared to the amount needed to finance the improvements discussed in section III. The total recommended program cost \$7.5 billion. ***It requires about \$100 million in annual revenues to finance each \$1 billion of program cost.*** This assumes the cost is financed through bonding with a 20-year bond repayment period.

Increase Gasoline Tax (yield: \$15-200M per year). The current state gas tax is 25 cents per gallon and yields about \$375 million per year. Every 1-cent increase in the gasoline tax will yield another \$14-15 million per year. Raising an additional \$100 million per year would require an increase of about 7

Summary Table of Alternate Revenue Sources

	Revenue Source	Revenue potential (annual)	Explanation
1	<i>Increase gas tax</i>	\$15-\$200M	Each penny per gallon of gas tax raises \$14-\$15 million annually. <i>This will be partially offset by some loss of sales at stations near state lines.</i>
2	<i>Transfer all gross receipts taxes (GRT) to STF</i>	\$120M	Currently about \$120 million per year of GRT revenues are <u>not</u> transferred to STF from General Fund.
3	<i>Increase gross receipts tax (GRT)</i>	\$19-\$38M	Increase GRT & transfer increase to STF. Each increase of one-half a percentage point raises \$19M annually) <i>This will be partially offset by some loss of sales at stations near state lines.</i>
4	<i>Transfer all car sales taxes to STF</i>	\$300M	Currently sales tax on cars sold thru dealers raises \$300M annually & goes into General Fund.
5	<i>Possible increases in federal formula funds</i>	\$6-\$100M	Annual increases are typically small (assume 1% or \$6M). Next authorization bill might provide some additional increase (assume 15% or \$100M).
Project-based or project-specific funding:			
6	<i>Possible new federal discretionary funds</i>	unknown	Next authorization bill might shift funding to a more discretionary or competitive basis. Additional funding for CT possible for certain projects, but projects must be eligible and competitive.
7	<i>Finance major projects with electronic tolls</i>	\$25-\$75M	"Electronic" tolling could finance most of the cost of large individual projects. Tolls on a major bridge or short section of freeway could raise \$25-\$75M annually to pay off construction bonds for that project.
TOTAL		\$0-\$800M	

cents per gallon.¹⁰ Restoring the previous 14-cent cut in the gas tax would raise about \$200 million. *Some of this increase will be offset by reduced sales at stations near state lines where drivers have the option of purchasing in neighboring states.*

The advantage of the gas tax is that it is relatively stable in terms of year-to-year fluctuations. The disadvantage is that the volume of gasoline sold is growing very slowly, and could decline in response to market forces, travel choices and federal fuel efficiency standards. These forces are expected to gradually shift the mix of vehicles in Connecticut to a much higher proportion of fuel-efficient vehicles or alternate fuel vehicles, such as electric vehicles. A more fuel-efficient fleet will reduce consumption of motor fuels and revenues from the gas tax.

Transfer Petroleum Gross Receipts Tax to STF (yield: about \$120M per year). The petroleum gross receipts tax (GRT) is a tax on petroleum wholesalers that is deposited into the state General Fund rather than the Special Transportation Fund (STF). The current tax rate is 7.0 percent and is projected to yield about \$285 million in FY 2012. Of that amount, \$165 million will be transferred to the STF to pay bonds on projects funded through the 2005 and 2006 transportation acts. The transfer of \$165 million to the STF leaves about \$120 million in the General Fund. If all the GRT revenues were dedicated to or transferred to the STF, it would make an extra \$120 million available for transportation investments annually.

¹⁰ Diesel tax is separate and calculated on an annual basis by the Commissioner of the Dept. of Revenue Services. The diesel tax rate effective July 1, 2010 is 39.6 cents per gallon. Every 1-cent increase in the diesel tax will yield approximately \$2.8 million per year

The disadvantage of the GRT is its volatility. It is based on the price of petroleum as well as the volume of petroleum sold. Since it is tied to the price of gas, tax receipts fluctuate with every fluctuation in the highly volatile petroleum market. Because a major purpose of the STF is to pay debt service on transportation bonds, that volatility may be of concern to the investment community.

Increase Petroleum Gross Receipts Tax. (yield: \$19-38M per year). In addition to transferring GRT revenues to the STF, the GRT tax rate could be increased to generate higher revenues. If the current rate of 7.0% were increased to 7.5%, it could generate an additional \$19 million per year. It should be noted that the rate is already scheduled to rise to 8.1% effective 7/1/2013. The latter will raise about \$38 million per year. *Some of this increase will be offset by reduced sales at stations near state lines where drivers have the option of purchasing in neighboring states.*

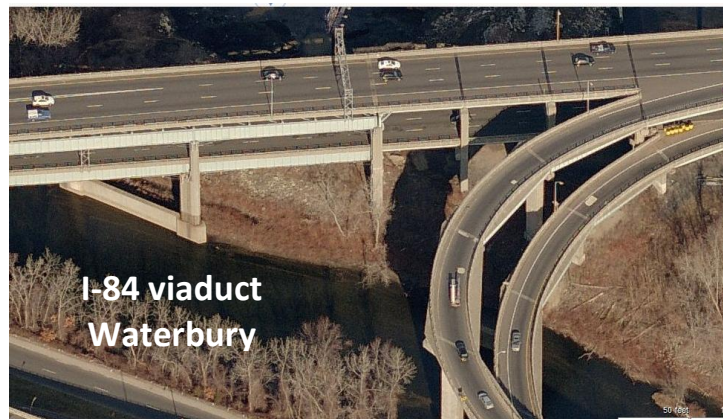
Transfer Sales Tax on Cars & Car Parts to STF (yield: \$300M per year).¹¹ The current 6 %tax on the sale of cars and car parts raises about \$300 million per year. All of these revenues go to the state's general fund rather than the STF. All or part of the revenues could be transferred to the STF.

Possible Increases in Federal Formula Funds (yield: \$6-\$100M per year). Connecticut currently receives about \$650 million annually in federal transportation funds. Almost all of it is through regular federal formula-based funding programs. Annual increases are typically small (1-2%). Federal programs are reauthorized every 5-6 years and can provide larger increases. However, given federal gas receipts and recent Congressional legislative trends, it is unlikely that Connecticut would realize a major increase. Assume 15 percent or \$100 million increase.

Possible Increase in Federal Discretionary Funds (yield: unknown) Future federal transportation programs are likely to include more discretionary or competitive funding. Connecticut could realize an increase in funding through discretionary programs under two conditions: (1) it aggressively pursues discretionary funding and develops the grant-writing capabilities required, and (2) if the discretionary programs are focused on the type of infrastructure problems and transportations systems that Connecticut needs to address.

Finance Major Projects with "Electronic" Tolling (yield: \$25-75M per project/year)¹²

Connecticut has been reluctant to reinstitute tolling due to safety, congestion and air quality problems associated with the system of tolling and toll booths it abandoned over 20 years ago. New systems of 'all electronic' toll tolling eliminate those problems and might offer a viable method for financing some of our largest and most expensive infrastructure projects. Not every project is a good candidate for such project-specific tolling. For good candidates, it offers an alternate funding mechanism that has been



¹¹ This is the sales tax paid when a customer purchases a car through a dealership. It does not include the sales tax paid when a car is sold by one individual to another individual as a private transaction. Taxes from private transactions are paid to the Department of Motor Vehicles and are placed in the STF.

¹² This type of project-specific tolling option differs from the tolling options explored in the 2008 tolling study conducted for the TSB. However, options included in that study might also warrant further exploration. They include congestion pricing, tolls on all freeways, tolls on trucks, border tolls, and tolls on express lanes.

successful in other states, both in terms of revenue generation and public acceptance.

Mega-projects such as the replacement of the I-84 viaduct in Waterbury (including the I-84/Rt8 interchange) can cost \$2-3 billion to build. The enormous cost of these projects makes it almost impossible to finance even one of them given Connecticut's current federal and state revenue streams. However, instituting electronic tolls within the project area could generate \$50-\$75 million annually. This would be enough to finance most of the project cost with toll revenue. Besides replacing an old and deteriorating highway structure, this project would greatly improve safety, eliminate a major traffic bottleneck and spur economic growth in the region and state.

Tolls could take longer to implement than other revenue options since they require changing legislation and developing an administrative system to manage the electronic collection. This includes negotiating with neighboring states to participate in programs like EZ Pass and exchanging motor vehicle registration information more easily.

V. Concluding Comments

A well maintained and efficient transport system that provides good connections to national and global networks is critical to the state's economic health. However, Connecticut is approaching a point when our level of transportation investment is neither sufficient to maintain a good state of repair nor support economic growth. The 2005 and 2006 transportation initiatives made substantial progress in developing a multimodal transportation system that reduced our dependence on highways, but those programs are winding down. We need to commit to a new investment initiative, or we risk slipping into a cycle of physical deterioration of existing infrastructure and continued economic stagnation.

To avoid these consequences, the Board is recommending an investment program that preserves our transportation infrastructure, enhances its performance, and improves access to national networks and markets. It strikes a balance between infrastructure preservation and system enhancement. It reflects the growing state emphasis on investing in transportation in a manner that not only achieves transportation objectives, but also supports economic growth, sustainable development, and livable communities. I

The total cost of the recommended program is \$7.5 billion. To afford such a large increase, the Board recommends developing a 10-year program that carefully matches a schedule of capital projects to a phased program of revenue increases. This will require the development of a better capital planning process at DOT as well as new sources of revenue. While the Board does not recommend specific revenue enhancements, it does suggest a variety of potential revenue sources that warrant examination. Some require increases in existing taxes or fees, while others are new sources that have the potential to yield large returns.

The fiscal challenges are great, but a program of strategic investments can yield large benefits to Connecticut's economy, foster sustainable development, advance environmental goals, and support more livable communities. Acting now allows Connecticut to build on the momentum from the 2005-2006 initiatives, which includes a new management structure at DOT and a new emphasis multimodalism.